Customer No.: 31561
Docket No.: 10721-US-PA
Application No.: 10/711,280

REMARKS

Present Status of Application

According to the Office Action dated February 7, 2007, claims 1 and 6 were rejected under 35 U.S.C. §102(b) as being anticipated by Lin (US Publication No. 2002/0105076; hereinafter Lin'076). Claims 3-4 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin'076 in view of Lee (US Publication No. 2002/0104449; hereinafter Lee'449). Claims 5 and 7-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin'076 in view of Lee et al. (US Publication No. 2003/0134496; hereinafter Lee'496).

After carefully considering the remarks set forth in this Office Action and the cited references, Applicants respectfully submitted that the presently pending claims are in condition for allowance. Reconsideration and withdrawal of these rejections are respectfully requested.

Discussion for 35 USC§102 and 103 rejections

Claims 1 and 6 were rejected under 35 U.S.C.§102(b) as being anticipated by Lin (US Publication No. 2002/0105076; hereinafter Lin'076). Claims 3-4 were rejected under 35 U.S.C.§103(a) as being unpatentable over Lin'076 in view of Lee (US Publication No. 2002/0104449; hereinafter Lee'449). Claims 5 and 7-8 were rejected under 35 U.S.C.§103(a) as being unpatentable over Lin'076 in view of Lee et al. (US Publication No. 2003/0134496; hereinafter Lee'496).

The Applicant has carefully considered the remarks set forth in the Office Action.

The Office Action considered that Lin'076 substantially disclose the present invention.

Applicants respectfully disagree and traverse the rejections based on at least the following reasons.

For the 102 rejections of independent claim 1:

Lin'076 discloses a method of removing damage to I/O pads that have been contacted by test probes (see Field of Invention). The Office Action asserted device elements (such as, diodes) recited by Lin (paragraph [0004]) as comparable to the LED chips of this invention. According to Lin's context (paragraph [0004]) reciting "The creation of monolithic integrated circuits requires the creation of numerous interacting electrical device elements, which are typically created in or on the surface of a semiconductor substrate. Among these device elements are transistors, diodes, bipolar transistors, CMOS Field Effect Transistors of either N or P channel type and the like.", it is clear to any sensible person that this statement merely describes various device elements in the semiconductor manufacturing industry. Further, nothing is mentioned anywhere in Lin's paper that the substrate 10 includes anything other than the aluminum contact pad 24. The Office Action does not provide a reasonable grounds or rationale about how Lin's teachings lead to equivalence or similarity as the step "providing a wafer having a plurality of LED chips thereon".

Moreover, as taught in Lin's paragraph [0090], layer 35 (alleged by Office Action

as the posts of this invention) of bump material is electroplated in contact with layer 34, which is contrary to the posts formed by a printing process as recited in independent claim 1 of this invention. The cycle time for forming the posts by a printing process is less than the cycle time for forming the posts by an electroplating process, and the costs for forming the posts by a printing process is lower. Also, the height and the composition of bumps formed by a printing process can be accurately controlled so as to improve the reliability of LED chip package structures.

Meanwhile, the Office Action asserted that the figs. 13-15 and related text of Lin'076 discloses the reflowing of the posts. However, the figs. 13-15 and related text of Lin'076 do not provide any description about the reflowing.

Applicants therefore submit that the independent claim patently defines over the prior reference Lin'076 for at least the reason that the cited art fails to disclose each and every feature as claimed in the present invention. Particularly, the reference Lin'076 fails to teach or suggest at leas the feature "providing a wafer having a plurality of LED chips thereon, wherein each of the LED chips comprises a plurality of electrodes", "forming a plurality of posts on the under bump metallurgy layers by a printing process" or "reflowing the posts".

Accordingly, the independent claim 1 clearly distinguishes the present invention over the cited reference Lin'076.

Dependent claim 6 is submitted to be patentably distinguishable over the cited reference for at least the same reasons as independent claim 1, from which these claims

respectively depend, as well as for the additional features that these claims recite. Meanwhile, Lin'076 only discloses the material of the Layer 33 of UBM can be Cr/Cu/Au multiple layers and the Layer 33 of UBM can be deposited by vacuum evaporation in paragraph [0087]. That is, Lin'076 fails to disclose, teach or suggest that "a material of the solder posts is selected from the group consisting of tin (Sn), silver (Ag), copper (Cu) and alloys thereof."

As for the 103 rejections, the Office Action relied on Lee'449 or Lee'496 for respectively teaching the additional features recited in claims 3-4 and claims 5 & 7-8.

However, neither Lee'449 nor Lee'496 is able to remedy the deficiencies of Lin'076. Because all the cited references fail to teach, suggest or disclose each and every feature of the present invention, and therefore they cannot possibly arrive at the claimed invention, as suggested by the Office Action. Moreover, the layer 35 of bump metal disclosed by Lin'076 is not formed with a printing process but formed with an electroplating process. Applicants respectfully submit that claims 3-5 & 7-8 patently define over the reference Lin'076, Lee'449 or Lee'496 for at least the above reasons, and should be allowed.

In view of the above discussions, reconsideration and withdrawal of these rejections under 35 USC 102(b) and 103(a) are respectfully requested.

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CONCLUSION

In view of the foregoing reasons, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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